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BULLETIN DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE
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Notes on the type-material of some European *Elasmus* (Hymenoptera : Chalcidoidea) and description of a new species from Madeira

by M. W. R. de V. Graham *

Résumé. — Le présent travail éclaircit quelques points de la systématique des *Elasmus* dont plusieurs représentants ont notamment été décrits par les anciens auteurs français Boyer de Fonscolombe et Giraud. L'auteur a désigné les lectotypes des espèces suivantes : *Elasmus bicolor* (Fonsc.), comb. nov., *E. flabellatus* (Fonsc.), *E. westwoodi* Gir., *E. viridiceps* Thoms., *E. albipennis* Thoms., *E. unicolor* Rond. En outre, il discute la position de *E. rufiventris* Ferr. et décrit *E. maderae* sp. n. de Madère.

Abstract. — Taxonomic notes are given on several European species of *Elasmus*, of which two where described by Fonscolombe, one by Giraud, two by Thomson and one by Rondani ; lectotypes are designated for these species. A further species is added to the British list and a new species from Madeira is described.

European *Elasmus* stand much in need of revision. The most recent account is that of Ferrière (1947), since when a considerable amount of additional information has come to hand. Several undescribed species appear to exist. Most of the published keys to *Elasmus* of different regions lean rather heavily upon colour-characters, which at all events in certain species are very variable. At the same time good structural features are often hard to find. Another fact that has held up progress is that the type-material of several of the earlier-described species has not been critically examined. The writer has investigated some of them and the results of this study are given here. Redescriptions of the types of two species are included, one of the species having been misidentified and the other not having been recognised as an *Elasmus*. The study is not carried further because Dr. Bouček has indicated to me his wish to revise other species and provide a key to those of Europe. We have discussed some of the taxonomic problems involved and have exchanged some information whilst avoiding overlap.

The type-material referred to is contained in the following institutions :

E. L. J. H. Boyer de Fonscolombe. Main collection in Muséum national d'Histoire naturelle, Paris ; additional material, some syntypic, in the Hope Department, Oxford. There is also some Fonscolombe material in Muséum d'Histoire naturelle, Geneva, but no *Elasmus*.

J. Giraud. Muséum national d'Histoire naturelle, Paris.

C. G. Thomson. Universitetets Zoologiska Institutionen, Lund.

* *Hope Department of Zoology (Entomology), University Museum, Oxford, Angleterre.*

I wish to thank my friends and co-workers who have given me access to the important collections and helped in other ways : Dr. Z. Boucek (Commonwealth Institute of Entomology, London) ; Pr. Carl H. Lindroth (Lund) ; Dr. J. R. Steffan (Paris).

Elasmus bicolor (Fonscolombe) comb. n.

Eulophus bicolor Fonscolombe, 1840 : 190, ♀.

This species has not been recognised since its original description... Some years ago I noticed, amonst the Fonscolombe material in Oxford, specimens of an *Elasmus* labelled " bicolor " in Fonscolombe's handwriting, but thought that *bicolor* was a *nomen nudum*. Later I realised that the specimens were original material of *Eulophus bicolor* ; in fact no other material has come to light and therefore I am selecting a lectotype from the Oxford specimens.

The syntypes in Oxford are two badly damaged specimens gummed to a square of paper, upon which is written " eulophus 3 " in Fonscolombe's handwriting ; below is a white label in the same handwriting " eulophus bicolor 3. nob. ". There is another label in Westwood's handwriting " See Letter of M. Fonscolombe recd Dec 3 1836 for Description & c " ; finally a blue lozenge marked with a W, which Westwood used to attach to specimens that had been given to him. I cannot trace the letter referred to above but clearly Westwood had seen the description of *bicolor* some three years before it was published. Of the left-hand specimen only the wings of the left side and some legs remain. The right-hand specimen is a female, lacking gaster, left-hand pair of wings, and left hind leg ; I designate this female lectotype of *Eulophus bicolor* Fonscolombe.

The body of the lectotype is somewhat squashed but it will probably be possible to identify the species satisfactorily by matching it eventually with fresh material. Some notes are given here :

Head reddish-orange ; vertex, and upper part of occiput except for a large spot on each side immediately behind the occipital carina, black ; antennal scape reddish, its dorsal edge slightly darkened ; pedicellus brown, paler beneath ; flagellum fuscous ; pronotum, front and sides of mesoscutum, propodeum except just beneath the dorsellum, and prepectus reddish-orange ; dorsellum (except the hyaline part) yellow ; wings infumate, with two fuscous clouds, one in the basal third and the other just beyond the middle of the wing, both touching the marginal vein and extending virtually across the wing ; legs yellow ; mid and hind coxae with a dark dorsal line ; all femora with their dorsal edge slightly darkened, the hind femora also darklined ventrally ; tibiae with the usual black bristles.

Head : POL/OOL ratio not measurable as the vertex is broken (but probably about 3) ; hind ocelli rather small, separated from eyes by about 1.6 times their own diameter, from edge of occiput by hardly more than half their diameter. Antenna : pedicellus in dorsal view slightly more than twice as long as broad, virtually as long as the first funicular segment (not counting anelli) ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; funicle only slightly stouter than the pedicellus, its segments subequal in length, each about twice as long as broad ; clava slightly broader than the funicle, about 3 times as long as broad, tapering and pointed apically, its first segment slightly longer than broad and occupying somewhat less than half the total length of the

clava ; sensilla in two rows upon each funicular segment and the first segment of the clava, in one row upon the second and third claval segments. Forewing only slightly wedge-shaped, i. e., not narrowing very strongly basad, the anal margin straight beyond the basal bend, apical margin nearly evenly curved ; no long bare line above the anal margin, merely a short one in the basal part.

The syntypes were reared by FONSCOLOMBE from a larva of *Psyche* [= *Amictoides*] *febretta* Fonsc. (Lep., Psychidae).

Elasmus flabellatus (Fonscolombe)

Eulophus flabellatus Fonscolombe, 1832 : 298, ♂♀.
Elasmus flabellatus (Fonscolombe) Steffan, 1962 : 35-36, ♂ ♀.

This species had been consistently misidentified prior to STEFFAN's paper in which he referred (1962 : 35) to the probable syntypes of *flabellatus* in Muséum national d'Histoire naturelle, Paris.

Besides these, there are some syntypes in the Hope Department, Oxford, sent to WESTWOOD by FONSCOLOMBE about 1833. These are (1) a male gummed to a piece of paper on which is written " ♂ eulophus 2775.2 ", with a label below " 2. eulophus flabellatus nob. " (both inscriptions in FONSCOLOMBE's handwriting) ; (2) two damaged females and remains of a third specimen, gummed to a rectangle of paper inscribed " eulophus ♀ flabellatus, nob. 2 " (in FONSCOLOMBE's handwriting), with a label below " M. Fonscol. " (in WESTWOOD's handwriting). The damaged females lack heads and antennae.

The syntypes in Paris comprise 7 specimens gummed to three rectangles of paper, as follows (1) a male and a female, both lacking heads, the paper marked " eulophus flabellatus ♂ & ♀ " ; (2) two females, the paper inscribed " flabellatus nob., ♀ eulophus 2 " ; (3) three females, the paper inscribed [fla] bellatus ♀ (the handwriting that of FONSCOLOMBE). The pin bearing the paper mount (3) also carries additional labels reading " Elasmus flabellatus ♀ " ; coll. Fonscolombe ; " Muséum Paris " ; and " Type " ; I designate the third specimen (on the right of the paper, above the word [fla] bellatus) as lectotype of *Eulophus flabellatus* Fonscolombe, 1832, since it is in the best condition of all the syntypes.

Besides the females recorded from France and Italy by STEFFAN (1962 : 35), the only correctly determined specimens of *flabellatus* that I have seen are those recorded by ASKEW (1968 : 2) from Hampshire, England, reared by E. C. PELHAM-CLINTON from *Pachythelia villosella* (Ochs.) and shown in ASKEW's figure 1. The WESTWOOD record from Surrey cited by ASKEW refers to a different species. Incidentally, *E. anius* Walker, which ASKEW suggests might be a colour form of *flabellatus*, is in fact a quite distinct and valid species.

Elasmus westwoodi Giraud

Elasmus Westwoodi Giraud, 1856 : 185-186, ♀, ? ♂.

In his original description GIRAUD stated " Je possède trois individus, 1 ♂ et 2 ♀,

sortis le 13 juin de petites galles molles cueillies sur le tremble (populus tremula) dont malheureusement je ne connais pas l'insecte producteur ".

GIRAUD's collection in Muséum national d'Histoire naturelle, Paris, contains a long series of an *Elasmus* with the first specimen of the series labelled " *Elasmus westwoodi* Giraud " in his own handwriting. Some bear wrong date or host-data, others are unlabelled. All appear to be conspecific and agree fairly well with the original description except that the legs are very dark. FERRIÈRE (1947 : 576) referred to these specimens but found it difficult to decide whether they were really the types or not. Clearly only three of them could be syntypes, but even after eliminating those with incorrect data it is impossible to be certain if any of the remainder are really the original specimens and, as mentioned above, they do not fully agree with the description.

Immediately below the above series stands a female *Elasmus* labelled in GIRAUD's handwriting " Elasmus metallescens m. Pop. trem. " ; it is mounted on a micro-pin fixed to a pith block. This specimen has paler legs and agrees very well indeed with the description of *Elasmus westwoodi* Giraud ; as it also bears the correct host-plant name, I now designate it lectotype of that species. I cannot trace the male and the other female syntype. The lectotype has the following characters :

Length of body 2.05 mm. Body black : head and thorax with slight bluish tinge, scutellum distinctly bluish ; propodeum bright blue-green, hind coxae tinged with the same colour ; dorsellum yellow, with a very narrow transverse blackish stripe at the base ; gaster bronze-black, with an obscure reddish band across the basal tergite just before its hind edge. Mandibles testaceous. Antennae brown (possibly rather faded). Legs black ; fore coxae pale at tips ; about the distal half of the fore femora, the tips of the mid and hind femora, testaceous ; tibiae testaceous, the hind tibiae becoming darker towards their external edge ; bristles of tibiae black, relatively conspicuous because of the pale background. Tegulae brownish ; wings lightly infumate, the infumation more intense below the stigmal vein ; venation brownish-testaceous.

Head in dorsal view 2.1 times as broad as long ; frontovertex breadth slightly more than half that of the head ; POL 2.75 times OOL ; hind ocelli separated by 1.25 times their diameter from the eyes, by about half their diameter from the edge of the occiput. Head in front view as high as broad. Eyes about 1.5 times as long as broad. Malar space about two thirds the length of an eye. Mandible with one large, one moderate-sized, and five small teeth. Antennal scape length slightly less than the transverse diameter of an eye ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; pedicellus in dorsal view about twice as long as broad, almost as long as the first funicular segment (not counting anelli) ; funicle slightly distorted but only slightly stouter than the pedicellus ; first funicular segment about 2.2 times, second about twice, third almost twice, as long as broad ; clava slightly broader than the funicle, rather more than three times as long as broad, tapering and pointed apically, slightly shorter than funicular segments 2 plus 3, its first segment somewhat longer than broad and occupying somewhat less than half the total length of the clava ; sensilla rather sparse, in two rows on each segment of the funicle and first segment of the clava, in a single row on the second and third segments of the clava.

Thorax about 1.75 times as long as broad. Width of posterior produced lobe of mesoscutum hardly more than one third the width of the mesoscutum itself, hind edge of the

lobe very shallowly emarginate. Forewing 3.6 times as long as broad ; apical margin not quite evenly rounded but very slightly subtruncate ; hind (anal) margin, between the point where the basal narrowing begins and the apical angle (tornus) of the wing, slightly concave ; the wing is distinctly wedge-shaped, its width at the point where the basal narrowing begins only slightly more than half the maximum width ; only a short bare line above the anal margin in the basal part of the wing. Bristles of hind tibia forming four elongate lozenges along the externo-dorsal surface.

Gaster about 1.25 times as long as head plus thorax (and nearly 1.5 times as long as the thorax), 3.7 times as long as broad, acute and acuminate apically, strongly carinate ventrally ; antepenultimate tergite with a slightly concave hind margin ; penultimate longer and about as long as its basal breath ; last tergite about as long as broad, shorter than the penultimate ; ovipositor sheaths projecting slightly.

The female of *E. vibicellae* Ferrière, 1947 (of which I have seen a syntype), is very close to that of *westwoodi* but differs in having shorter funicular segments (the first less than twice, the third hardly 1.5 times, as long as broad).

Elasmus albipennis Thomson

Elasmus albipennis Thomson, 1878 : 206, ♂♀.
Elasmus albipennis Thomson ; Ferrière, 1947 : 574-575, ♂♀.

Syntypes, 16 specimens on 6 pins. Lectotype, a female labelled " Hlm. " and (in Thomson's handwriting) " albipenis Ths. ".

This species is correctly identified in the collections I have seen.

Elasmus viridiceps Thomson

Elasmus viridiceps Thomson, 1878 : 205-206, ♀.
Elasmus viridiceps Thomson ; Ferrière, 1947 : 578-579, ♂♀.

There are three females in Thomson's collection, all conspecific. Two of them are labelled " B.S. " (Bothnia Septentrionalis) and cannot therefore be syntypes. The third specimen, labelled " Lp. in " and " Bhn " is designated lectotype ; it lacks antennae.

The female of this species is close to that of *elongatus* Ferrière, but has a shorter gaster whose last tergite is not or hardly longer than its basal breadth ; the ratio POL : OOL is less than in *elongatus*, whilst the head, propodeum and hind coxae are strongly greenish-tinged.

Elasmus unicolor (Rondani)

Heptocondyla unicolor Rondani, 1877 : 182.
Elasmus fumipennis Thomson, 1878 : 206, ♀.
Elasmus westwoodi Giraud ; Ferrière, 1947 : 575-576 [misidentification].

Syntypes of *Elasmus fumipennis* Thomson : four females (a fifth specimen, a male, stands with them but Thomson did not describe that sex). Lectotype : a female labelled " Gl. " and " Bhn ".

The species name *fumipennis* has been synonymised with *unicolor* Rondani by Bouček (1974 : 271).

Elasmus rufiventris Ferrière

Elasmus rufiventris Ferrière, 1947 : 576-577, ♂♀.

Females which appear to belong to this species vary considerably in the colour of the gaster and the degree of infumation of the forewings. Some approach close to females of *fumipennis*, though probably the two species are distinct. Ferrière described the female gaster as red with only the apex black ; this is true of the holotype and paratype females, which I have seen examined, but other females in the Paris collection that are certainly conspecific have darker gasters. The British females which I believe to be *rufiventris* also have mainly dark gasters. Incidentally the holotype has the lower part of the sides of the pronotum reddish, a feature which I have not seen in other specimens.

E. rufiventris may be added to the British list on the basis of the following records :

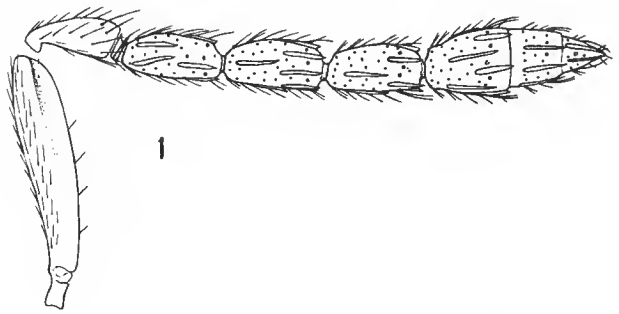
England : Surrey, Coombe Wood, one female, 15.vi.1835 (J. O. Westwood) ; Richmond Park, on grass, 4.vii. (year not stated) (J. O. Westwood). A male labelled " Richmond Pk " by Westwood may belong to the same species.

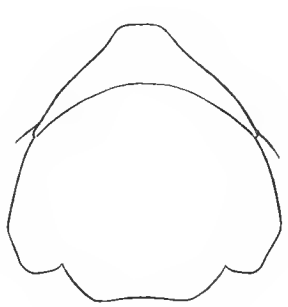
Elasmus maderae sp. n.

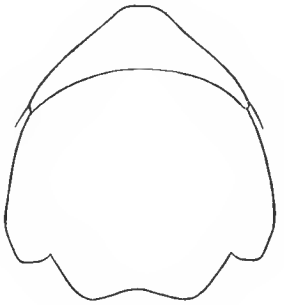
Female. — Black ; propodeum with a strong brassy tinge, the vertex, pronotum, mesoscutum and scutellum with rather less strong brassy, greenish, or coppery tinge, a weak tinge also on the dorsal part of the hind coxae, and sometimes on the pleuron ; gaster usually reddish beneath and with irregular reddish-testaceous transverse bands on the four proximal tergites, these bands sometimes broken in the middle ; mandibles yellow ; lower half of head yellow except just between the antennal toruli ; vertex with a yellow triangular spot on each side touching the eye and the lateral ocellus, and extending a short distance across the occipital carina on to the occiput ; the yellow face and the vertical spot of each side joined by a very narrow yellow line along the inner orbit ; antennae fuscous with the scape paler below and the radicula reddish ; dorsellum, except the hyaline apical part, yellow ; front edge of tegula, and basal plate of forewing, yellow ; forewing slightly yellowish tinged, more strongly so just below the marginal vein ; venation brownish-testaceous ; legs yellow with extreme base of fore coxa and about proximal two thirds of mid and hind coxae black ; fore femora with blackish dorsal stripe, mid and hind femora black with bases and tips broadly yellow ; the rows of bristles on the mid and tibiae and tarsi, and the bristles forming the lozenge-pattern on the hind tibiae, black. Length 2.1-2.5 mm.

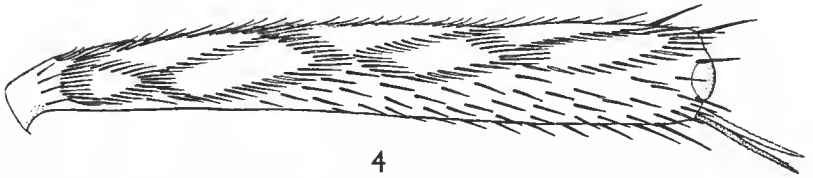
Head approximately as wide as the mesoscutum, in dorsal view 2.2-2.4 times as broad as long ; POL 1.7-2 times OOL ; hind ocelli oval, separated from the occipital edge by one

third to nearly half their own diameter. Eyes about 1.5 times as long as broad, separated by slightly less than their own length, inner orbits parallel. Malar space about one third the length of an eye. Breadth of oral fossa about twice the malar space. Antenna









FIGS 1-4. — *Elasmus* species : 1, *E. maderae* sp. n., ♀, right antenna ; 2, *E. maderae*, ♀, pronotum and mesoscutum ; 3, *E. steffani* Viggiani, ♀, pronotum and mesoscutum ; 4, *E. maderae* sp. n., ♀, left hind tibia.

(fig. 1) : length of scape about equal to the transverse diameter of an eye ; combined length of pedicellus and flagellum hardly greater than the breadth of the head ; pedicellus in dorsal view about twice as long as broad, slightly shorter than anelli plus first funicular segment ;

funicle of virtually equal thickness throughout, hardly stouter than the pedicellus ; first funicular segment (not counting the anelli) 2-2.4 times, second 2-2.2 times, third about twice, as long as broad ; clava slightly broader than the funicle, 2.5-3 times as long as broad, slightly shorter than funicular segments 2 plus 3, pointed apically, its first segment occupying slightly less than half the total length ; sensilla sparse, in two partial rows on each segment of the funicle and clava.

Thorax 1.7-1.8 times as long as broad. Mesoscutum (fig. 2) somewhat broader than long ; hind edge of its postero-medial lobe hardly at all emarginate. Scutellum with two pairs of long coarse bristles. Dorsellum about as long as its basal breadth. Hind tibia with pattern of bristles as in figure 4. Forewing a little more than 3 times as long as broad, wedgeshaped, broadening distinctly from the end of its basal quarter to the apex, the anal margin straight or very slightly concave ; a bare strip, bordered above by a line of hairs, runs along the anal margin to about half the length of the wing, then becomes extremely narrow ; above this the wing is completely pilose except for a narrow bare strip below the marginal vein at the junction of the basal and second quarters of the wing ; just below the marginal vein, on the lower surface of the wing, there is a row of 8-13 " admarginal bristles ".

Gaster slightly longer than head plus thorax, slightly to distinctly narrower than the thorax, slightly acuminate apically, 3.4-3.9 times as long as broad ; last tergite about as long as its basal breadth ; ovipositor sheaths very slightly exserted beyond the last tergite.

Male. — Unknown.

Holotype and paratype females in Graham collection ; one female paratype in the British Museum (Nat. Hist.).

Madeira : Machico, Rocha Alta, about 1,700 feet, 8.i.1973, five females (holotype and paratypes), swept from herbage at the edge of pinewood (Graham) ; unlocalised, probably taken by T. V. Wollaston before 1855, one female (paratype) in B. M. (N. H.), determined by Walker as *flabellatus* Fonscolombe.

The female of *maderae* is very close to that of *steffani* Viggiani (= *masii* Steffan, 1962, = *flabellatus* Masi, 1907, nec Fonscolombe, 1832). The latter differs mainly in its shorter antennae, with combined length of pedicellus and flagellum slightly less than the breadth of the head, funicular segments shorter, the first slightly shorter than or barely as long as the pedicellus, 1.9-2.1 times as long as broad, second 1.4-1.7 times, third 1.3-1.5 times, as long as broad ; clava shorter and broader, 2-2.3 times as long as broad. It also has only 7-9 admarginal bristles on the forewing in the specimens seen ; POL 2-2.5 times OOL ; forewings hyaline or nearly so ; mesoscutum, scutellum and propodeum not distinctly metallic ; head sometimes black except for pale spots on each side above the clypeus ; legs sometimes relatively darker ; hind edge of postero-medial lobe of mesoscutum (fig. 3) distinctly emarginate.

The female of *viridiceps* Thomson differs from that of *maderae* as follows : — Head without yellow markings ; tegulae and basal plate of forewing dark ; dorsellum with a broad black transverse band at the base ; gaster, all coxae, mid and hind femora almost entirely, black ; tibiae and tarsi somewhat infuscate ; head in dorsal view hardly more than twice

as broad as long, POL 2.3-2.5 times OOL ; combined length of pedicellus and flagellum 1.1-1.15 times the breadth of the head.

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Les *références bibliographiques* apparaîtront selon les modèles suivants :

Bauchot, M.-L., J. Daget, J.-C. Hureau et Th. Monod, 1970. — Le problème des « auteurs secondaires » en taxionomie. *Bull. Mus. Hist. nat., Paris*, 2e sér., 42 (2) : 301-304.

Tinbergen, N., 1952. — The study of instinct. Oxford, Clarendon Press, 228 p.

Les *dessins* et *cartes* doivent être faits sur bristol blanc ou calque, à l'encre de chine. Envoyer les originaux. Les *photographies* seront le plus nettes possible, sur papier brillant, et normalement contrastées. L'emplacement des figures sera indiqué dans la marge et les légendes seront regroupées à la fin du texte, sur un feuillet séparé.

Un auteur ne pourra publier plus de 100 pages imprimées par an dans le *Bulletin*, en une ou plusieurs fois.

Une seule épreuve sera envoyée à l'auteur qui devra la retourner dans les quatre jours au Secrétariat, avec son manuscrit. Les « corrections d'auteurs » (modifications ou additions de texte) trop nombreuses, et non justifiées par une information de dernière heure, pourront être facturées aux auteurs.

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